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Allelopathy in the Tropical Forage Grass *Brachiaria brizantha*

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Abstract

Species of the tropical genus *Brachiaria* are widely used in improved pastures. Field observations with the particularly widespread *Brachiaria brizantha* cv. Marandu indicate that it can be difficult to establish and maintain mixtures with a legume. Furthermore, in grass-only pastures complete lack of seedling recruitment has been observed. A reason for both phenomena could be allelopathy.

To elucidate the allelopathic potential of *B. brizantha* cv. Marandu in comparison with three other *Brachiaria* cultivars of current economic importance, *B. brizantha* cv. Toledo and the *Brachiaria* hybrids Mulato and Mulato II, two laboratory bioassays were conducted with aqueous extracts, in different concentrations, from (1) leaves and (2) roots of the four cultivars, testing their effect on (1) the grasses themselves (autotoxicity test) and (2) three forage legumes, *Leucaena leucocephala*, *Desmodium ovalifolium*, and *Pueraria phaseoloides*.

The autotoxicity test showed germination inhibition and a retarded seedling growth in the treatments with cv. Marandu and Toledo. This could be caused either by allelopathic effects or the high osmotic potential of the extract solution. In the test with the legumes, aqueous leaf extract of cv. Marandu showed faint but not significant effects such as germination inhibition, reduced weight and root length of seedlings of *D. ovalifolium* and *L. leucocephala*. In contrast, low concentrations of cv. Marandu extract had beneficial rather than harmful effects on seedling growth of *L. leucocephala*. Similar observations of growth stimulating effects of allelochemicals in low concentrations are reported for other species.

The findings confirm the allelopathic potential of *Brachiaria brizantha* cv. Marandu. However, further research is needed to elucidate the complex issue of allelopathy within the genus *Brachiaria*. Such research should include (1) work in pastures where alleged allelopathy has been observed as well as (2) a comprehensive participatory survey in order to complement the rather anecdotic information available so far.

Keywords: Allelopathy, *Brachiaria*, Forage grass